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Training Policy Study for the Office of the Vice-President, Planning

TRAINING POLICY STUDY

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INTRODUCTION

In fulfilling its mandate to support research in the Third World, the Centre has emphasized the building of research capability and recognized the vital importance of training in achieving this goal. Because training is philosophically an important and useful way of improving research capability, OVPP proposed to Management Committee in mid-1979 that an assessment of the effectiveness and appropriateness of Centre training be initiated.

This study aimed at documenting and analyzing the Centre's past efforts in training and recommending guidelines for improving the Centre's effectiveness in supporting the training requirements of scientists from the Third World. The general goal was to provide a qualitative and quantitative assessment of the Centre's training programs, and, specifically to:

A. provide for selected countries, a crude estimate of the demand for, and supply of, research training by training type or level and by profession;

B. assess the Centre's contribution to the supply of trained research personnel by country or region, by training type or level, and by profession;

C. draw on external studies and reviews and Centre experience to assess the value or impact of various approaches to research training;

D. describe, compare, and assess various Centre policies (implicit and explicit) and operational practices that have been developed to support training activities;

E. describe and assess the Centre's administrative infrastructures that have been developed to support training activities;

F. assess and compare the overall benefits and impact of various Centre training programs and recommend practical guidelines and suggestions for improving the Centre's training policies, programs and practices.

Due to serious data limitations, some goals could only be tackled superficially. For this and other reasons, less emphasis was put on the structural and operational issues in the study and the literature review of the global availability of researchers was minimized. A quantitative assessment of the Centre's training activities proved difficult to complete. Likewise, precise and objective judgements on the merits of past training initiatives (Centre and outside) were sparse and consequently, the value of various training methods could not be defined clearly.

As a consequence, this summary document should not be viewed as a definitive statement on training nor as a comprehensive evaluation of Centre training. Rather, it is a progress paper on the information that has been collected and analyzed. A preliminary policy paper such as this cannot do justice to the complexity of the subject and there is no consensus on some of the issues raised in this paper. Training activities and assessments of Centre training are evolving and ongoing exercises. Thus, the intention of this paper is to stimulate further analysis and debate and contribute to a refinement of Centre policies and practices.

METHODOLOGY

A Training Advisory Committee (TAC), was established to review the progress of the study and to provide divisional and program advice at various stages of the analysis.

All Centre program divisions were contacted at the outset to gain their opinions on the importance of training and their suggestions on questions the study should address.[1] Generally, the study followed an iterative process, whereby those involved in, and affected by, Centre training programs helped to define the problems and suggest solutions.

The analysis utilized three basic research instruments or tools:

Desk Research, including file reviews of all AFNS projects with a budgeted training component, all Human Resources trainee files, a sample of other division files, and Board minutes. An extensive literature search was conducted on the value of various forms of training, a cursory analysis of other donor agency training programs was completed, and some assessment of the demand and supply of scientists in the Third World was undertaken. A review of other training evaluations was also performed.

Questionnaires were designed for three groups of individuals -- trainees, trainee supervisors, and project leaders. Approximately 1200 questionnaires were mailed with an overall response rate of 47%. The

1. All program divisions were asked to comment on the following areas:
   a. How does your division define training and wnat (activities) are included in your divisions definition of training?
   b. Why is your division supporting training?
   c. How important is support for training compared to other kinds of activities supported by the division?
   d. What major questions or issues relating to Centre training would you like incorporated in this study?

distribution and response rate for each questionnaire was:

		Number Sent	Response Rate
TRAINEES:	Direct IDRC	474	64%
	Via Technonet	200	32%
	Via ADC	84	44%
PROJECT LEADERS		251	29%
TRAINEE SUPERVISORS		191	46%
T O T A L		1200	47%

The response rates were considered very good since some of the names and addresses were over 7 years old.

The trainee questionnaire was pre-tested on a sample of 30 award holders, and then revised before being mailed to all IDRC supported trainees for whom addresses were available. The trainee questionnaire was the most extensive of the three surveys and contained 48 questions. Although the questionnaire was lengthy and complex, few complaints were received and few questions were misinterpreted.

All mail surveys were coded and subsequently summarized by the IDRC computer science group.

1. These Centre-supported projects were predominately or exclusively of a training nature.

CASE STUDIES AND INTERVIEWS

A. Case Studies: A small sample of countries including both LLDC[1] and better endowed countries were selected for a national review of training needs, research capability, and IDRC impact. Under the direction of the IDRC Regional Offices, analyses and interviews were conducted in Indonesia, Nigeria, Mali, Egypt, the Philippines, Colombia, and Bolivia -- the last three conducted by country nationals.

B. Interviews: Interviews were scheduled with trainees resident in Canada, with trainee supervisors at Canadian institutes, and with a sample of IDRC staff.

Most components of the study were analyzed and written as self contained reports and parts of each individual report were synthesized in this document. Some of the component reports have been condensed. Complete documents are available on request and include:

Analysis of In-Project (AFNS) training
Analysis of the Fellowship Program Awards
Summary of the Trainee Mail Survey
Summary of the Trainee Supervisor Mail Survey
Summary of the Project Leader Mail Survey
Country Profiles
Background Report on the Availability of Researchers

1. Throughout this paper, LLDC is used when referring to the 30 least developed countries as designated by the UN Economic and Social Council.

Most component reports were distributed selectively within the Centre for comments and verification. This summary document was also distributed to members of the TAC before being submitted to the Management Committee and the Board of Governors.

ORGANIZATION OF THE REPORT

1. The summary recommendations (blue pages) begin on page 8.

2. The remainder of this report is divided into two parts:

   A. Background which documents broad global training perspectives, provides a quantitative assessment of the Centre's training programs, and gives a brief description of the divisions' approaches to training.

   B. Issues which reviews major themes identified during the study -- issues such as the best location for training, the types of countries which should receive more training support, training methods that best serve the needs of the research project, the role IDRC should have in projects that are primarily training the importance of training in building research capability, and the fields of study that IDRC should encourage.

Definition of Training

Training, has been defined as an organized activity designed specifically to transfer skills and knowledge which are, for the most part, necessary for researchers.

A classification of the training methods employed by the Centre is presented in Table I.

Table 1. CENTRE USE OF TRAINING METHODS

	FORMAL	SEMI-FORMAL	INFORMAL
TYPE	Degree: PhD, Msc, MA, BA, BSc. Diploma: Undergrad, Post-grad.	Short Courses	On-the-Job (in-service)
CENTRE MECHANISM	Pre-project awards Post-project award In-project awards Primarily training projects Fellowship awards	Pre-project In-project Training workshops Training seminars Primarily training proj.	Study tours Network projects and workshops Apprenticeships IDRC staff visits Consultancies In-project awards Primarily training projects

Formal Training incorporates those activities that develop skills and abilities related to a field of specialization and a given course of supervised study resulting in some form of credit.

Semi-formal Training encompasses short courses not necessarily leading to a formal degree or diploma. The courses are directed toward the acquisition of specific methodological or technical skills or the acquisition of knowledge in a new and innovative subject area. These semi-formal methods are designed with a specific purpose in mind and are imparted in a formal setting.

Informal Training involves on-the-job activities that allow individuals to acquire skills while practising research. This may be supplemented by workshops, practical courses, and study tours. Small research grants and apprenticeships are two of the most widely used informal training mechanisms.

SUMMARY OF MAJOR RECOMMENDATIONS

This chapter highlights the major policy issues, although specific recommendations relevant to Program Divisions have been made throughout the report. The study team does not perceive this report to be a definitive statement of training policy for the Centre. Instead, it provides a basis for debate and discussion within the Centre and it is hoped that this process will be served by the report and the work done to date (for example, the analysis of questionnaires, file reviews, country profiles, etc.). This approach was adopted partly because of the complexity of the subject and the paucity of data, but more important because the study team did not find any fundamental faults in the philosophy and policies implied in the Centre's training activities.

IDRC's support for research training has evolved considerably since the publication of the first policy paper[1] in 1973 which stated that the "Centre has no programs of scholarships or other formal training assistance at any educational level." It has been estimated that the Centre has spent over $20 million and supported more than 3,000 trainees in the first ten years. Support for training accounts for more than 10% of current program appropriations and there is every likelihood that this level will at least be maintained, if not increased, in the future.

The Program and Policy Review (1981-84) noted that the Program Divisions are redirecting their overall support to countries with weak research infrastructures and to provincial institutions in others.

1. W.D. Hopper, Research Policy; Eleven Issues, IDRC-014e. 1973

When combined with the greater interest shown within Program Divisions for training support in new or neglected research areas, it is likely that the Centre's involvement in training will increase in the future. However, the magnitude of training support will be considerably affected by the balance struck between the reliance on the research project mechanism for training and its combination with primarily or specific training projects.

Given this situation, the study team believes that although it is not desirable to draw up a rigid training policy applicable Centre-wide, certain guidelines and recommendations should be adopted to help the Centre make future decisions on training activities more systematically.

GUIDELINES

1. The Centre recognizes that training is a necessary condition for effective research and for building research capability in developing countries. The design, selection, implementation and monitoring of Centre-supported training are important Centre activities.

2. The same principles of responding to developing country needs and of maximizing the involvement of developing countries in designing, managing and implementing their research programs should apply to training.

3. The Centre has neither the mandate nor the necessary resources to meet general training requirements in any particular country. Accordingly, most Centre support for training should be included as a component of research projects within the program priorities of the Centre.

4. At the same time, the Centre recognizes that it can play a useful role in building research capability in new or neglected research fields and in testing innovative training methods by financing specific training activities.

5. Priority should be given to training in the trainee's own or other Third World country. This would, in certain cases, require funding to build up selected training institutions in the developing world.

While the guidelines should be judged on their own merits, the study team believes that they are consistent with the findings of the study and with the general principles which guide the Centre. The recommendations which follow address the main issues raised in the study and provide the means for implementing the guidelines. For reasons of brevity, substantiating evidence has not been generally included in the recommendations, and instead, the reader should refer to the body of the text.

RECOMMENDATIONS

Program Priorities

The majority of IDRC support for training in the past has occurred within Divisional projects where the Centre has technical expertise. Some components (pre- and post-project awards) of the Fellowship Program have also been linked to projects.

IT IS RECOMMENDED THAT this continue, with all training closely related

to the Centre's program priorities. If the project mechanism is the primary vehicle for Centre supported training, then training activities will remain within the Centre's program areas. This recommendation would also imply that, at least in the short-term, specific training activities would be confined to current program areas, including new areas such as MINISIS or neglected areas such as agroforestry. Further, the Fellowship Program should pursue its intention to place emphasis on awards which complement program priorities of the Centre, even in the case of individual awards not related to projects.

However, a small portion of funds for Fellowship Program activities should be earmarked for awards to exceptional individuals with no restrictions on the field of study. Further, in response to LDC research training needs, when better and more complete information on the research training needs of individual countries becomes available, the Centre should be prepared to move outside the program areas through specific training activities in new and pioneering fields.

Training Through Research Projects

The study demonstrates the clear advantages of linking training to research projects. IT IS RECOMMENDED THAT wherever possible, in-project training should be designed and scheduled to enable trainees to become directly involved in at least a part of the project or in a subsequent phase. Similarly, pre-project awards should be short enough (usually less than 12 months) for the trainees to become involved in the project. Post-project awards should be offered only to individuals who have been involved in Centre projects and are able to contribute to the development of the research community after the termination of the award. The present policy of the Fellowship Program is in accordance with the recommendation for pre- and post-project awards.

Specific Training Projects

In spite of the strong justification for maintaining the project orientation in training, there is a need to take a broader and long-term view of training needs. The Program and Policy Review (1981-84) drew attention to the shortage of trained researchers as a major constraint in developing research programs in certain sectors. The Centre has, in the past, initiated a number of innovative projects which were explicitly geared to the training of scientists as their primary objective and these projects represent a valid method of achieving Centre objectives. IT IS RECOMMENDED THAT the Centre should take a longer-term perspective and finance specific training projects in areas of critical shortage within the Centre's program areas. In supporting such projects, emphasis should be given to the utilization and strengthening or development of a training capability in the Third World. No specific training project which provides individual grants should be approved which duplicates the awards provided through the Fellowship Program unless some local institutional capability or expertise is being utilized or developed.

Geographical Concentration of Training

The study illustrates the concentration of training support in certain geographical regions, in specific countries and in certain institutions. Since research projects were the main instrument for supporting training activities in the past, it is to be expected that the training pattern would more or less coincide with the project pattern. IT IS RECOMMENDED THAT future training support be focused more on the LLDCs. The implementation of this recommendation implies either a similar shift in the project pattern, or an increase in the training component of budgets in LLDC projects, or a greater number of specific training projects being financed in the LLDCs.

In recognition of the different training requirements of developing countries at various stages of development, IT IS RECOMMENDED THAT a greater portion of funds be allocated to more formal training in the LLDCs,where the shortfall in the number of formally-trained scientists appears to be the greatest; whilst in the more advanced LDCs, emphasis should be given to training activities geared to building up specific research skills.

Type and Level of Training

The different sources of information utilized for this study raised serious questions about the merits of long-term degree training, although there is no concensus on this issue. Concerns were raised about the cost , the relevance and the need for PhD training. The review in this paper indicates that the Centre's operating style gives it a comparative advantage over other donors in supporting short-term training. This also fits more appropriately within the research project mechanism on which the Centre relies.

IT IS RECOMMENDED THAT:

A) Less support be given to longer-term formal degree training, and more specifically:

   (i) support for PhD training be given only in exceptional circumstances;
   (ii) whenever post graduate training is considered, a Masters program should be given preference, with, if training takes place abroad, a combination of home-based research and training in advanced institutions abroad;
   (iii) the Centre should not normally support under-graduate diploma and Bachelors degree training since facilities for these are generally available in local institutions.

Training in this category is most appropriately handled as part of a research project or the project-related component of the Fellowship Program.

B) The Centre should encourage more short-term and informal training courses designed to build up skills in a particular discipline, and more specifically:

(i) the use of short courses and specially designed workshops should be encouraged to enhance skills in new subject areas and in new technologies. The Centre must be prepared to support, help design and monitor such activities;

(ii) since there is evidence to suggest that some study tours have questionable training value and are expensive and difficult to plan and administer, they should be supported with caution. Multi-country, short duration tours for junior scientists should be discontinued;

(iii) the Centre should explore whether the preparation and dissemination of research progress reports, questionnaires and other research materials of on-going research projects would be useful rather than only circulating the final results;

(iv) since many research skills can be derived through supervised on-the-job training, this approach should be encouraged with more care given to specifying the advisory role of supervisors; and

(v) since many Centre staff and consultants visit projects frequently, more attention should be given to their potential function as trainers. In the case of activities such as MINISIS, DEVSIS methodology, the need for Centre staff to be involved in training until a capability is developed elsewhere should be recognized.

These activities could either be handled as a component of research projects or as specific training activities.

Building Specific Research Skills

In addition to training needs which are basically discipline-oriented, the study has identified several general skill deficiencies needing improvement and attention. The study team recognizes the need to focus on the overall skill requirements of the research team and the recipient institution rather than on the educational requirements of the individual scientist. Accordingly, a number of specific skills have been identified as being very weak in many research institutions. Therefore, IT IS RECOMMENDED THAT:

(a) since many project teams are deficient in research support skills, the Centre should entertain more requests for training in data collection and analysis, laboratory techniques, etc., which tend to improve the skills of more junior researchers;

(b) since research management skills appear to be weak in many institutions, the Centre should provide more support for upgrading these skills, primarily for middle-level and senior researchers. The Centre should experiment with short courses to teach research management in selected LDC institutions.

(c) the Centre explore the feasibility of strengthening the capability of middle and low level personnel involved in program operations and delivery of services as proposed by the Health Sciences Division.

Since these are general skill deficiencies, they could best be handled through workshop training activities to reach a larger group, possibly under the auspices of the Fellowship Program. Where the skills are strongly discipline-oriented, the activities should be organized by the appropriate Program Division.

Location of Training

At lease conceptually, the location of training would not be an issue for the Centre if it proceeds to identify needs and tries to meet them in the best possible way. In this case, the best location for training would be determined by the nature of the needs. Although a considerable number of trainees have studied in industrialized countries in the past, there are constraints emerging which make it imperative to consider other options in the interests of the long-term benefits to the LDCs. Hence, IT IS RECOMMENDED THAT the Centre give priority to placing trainees in training institutions in their own country or elsewhere in the Third World. Although training in a more industrialized country may be more appropriate for senior researchers or in situations where no other option exists, for reasons of relevance of training, long-term developmental impact and possibly cost, priority should be given to using training facilities in the Third World. This requires a longer-term perspective to be taken as we cannot expect a major shift in the short-term. In some cases, it would involve a commitment to build up training capabilities of LDC institutions to provide adequate facilities for Third World trainees.

Where no appropriate local or other LDC facilities exist, trainees should be placed in compatible research environments, with home-based field research and provision made for monitoring visits by supervisors built into the training program. The selection of supervisors should be based on their familiarity with the problems of LDCs and experience in fields of research appropriate to the needs of trainees. The supervisor should have a complete briefing on the trainee's involvement in research projects in his home institution and the relevance of his current training to these research activities.

It has been noted that a comparatively large number of trainees supported by IDRC have received their training in an industrialized country other than Canada, particularly in the United States and Britain. In view of the creation of the Co-operative Program with a mandate to increase collaborative research activities between Canadian and Third World institutions, IT IS RECOMMENDED THAT appropriate Canadian institutions be identified for locating trainees and the Canadian option be explored before sending trainees to other industrialized countries.

Follow Up Activities

The study team found it extremely difficult to gather and analyse the data on training supported by IDRC and it has been a particularly arduous task to assess the justification for the various training initiatives that have been financed by the Program Divisions in the past. With a view to improving the data base for future analysis, IT IS RECOMMENDED THAT project documentation should, in future, provide a more explicit rationale for training activities, their design, budget and number to be trained, location and other pertinent data. This would enable the Centre to better manage the different training initiatives that have been financed and to evaluate the purposes and cost effectiveness of the various training mechanisms.

There is a need to ensure the improvement in data collection and to augment the capability to monitor, analyse and evaluate the different training initiatives. Hence, IT IS RECOMMENDED THAT a permanent but ad hoc Training Advisory Committee be set up with specific responsibilities for:

(a) improving the collection of data on training activities;

(b) exchanging information on divisional training initiatives and functioning as an inter-divisional pool of training expertise;
(c) monitoring the evaluation of training initiatives; and
(d) reviewing training policies and practices as they evolve within the Centre.

It is expected that the staff of the Education Program in the Social Sciences Division and those in the Regional Offices will be closely associated in these follow-up activities.

GLOBAL PERSPECTIVES

Ideally, it would have been useful to examine IDRC's training activities within the broader context of the demand for, and supply of, trained research scientists but, given the paucity of manpower studies and the limited scope of this review, it has not been possible. There are, however, a few broad trends which are sufficiently well documented to be worth noting, although even these should be interpreted with caution.

Availability of Scientific Manpower

There is considerable heterogeneity between LDC's with some countries having trained manpower levels approaching those in the industrialized countries. (Table 2).

Selected studies indicate that the relative proportion of those scientists engaged in R & D in the LDC's varies even more than the variation in total availability of scientists and engineers shown in Table 2. When one classifies manpower by discipline the differences become more extreme with some countries having a per capita availability of scientists in some disciplines similar to that found in the more industrialized countries while there are almost no scientists in other fields.

One could argue this limited data suggests that there are some countries in which the Centre should be very cautious about providing more formal academic training while in others the shortage is so severe that it is difficult to fund research projects without some increase in the availability of trained scientists.

Table 2 NUMBER OF SCIENTISTS AND ENGINEERS PER 10,000 POPULATION FOR COUNTRY GROUPS AND FOR A SAMPLE OF INDIVIDUAL COUNTRIES

SAMPLE	NUMBER
Average of 21 more industrialized countries	222
Average of 45 Third World countries	54
Better Endowed LDC's	
Egypt	178
Philippines	177
South Korea	133
Less Endowed LDC's	
Zambia	24
India	21
El Salvador	14
Sudan	9
Cameroon	6
Thailand	5
Kenya	3
Togo	2

Source: UNESCO

2. Training Capability in the LDC's

While most LDC's have increased the number and level of training facilities, there are still serious general gaps in certain regions, and in specific fields of study and at higher levels of education even within the better endowed countries. The country profiles provide many examples. The Philippines

profile stated that there "is a consensus that educational institutions in the Philippines are perfectly qualified to train masteral level students". On the other hand, Colombia with a long tradition of university training still does not have any PhD programs.

Training Outside the LDCs

The number of people who receive training (not necessarily designed for researchers) in a more industrialized country is thought to have grown considerably during the 1970s. However, it is equally apparent that many of these trainees are from oil rich nations and few from an LLDCs.

EXAMPLE: Seventy-five percent of all LDC students studying in the U.S.A. (1979) originate from only 15 countries. Only 4% of the total are citizens of a LLDC. The situation is even more serious since there has been a recent general shift in American policy away from training human resources which has "been most costly in African countries (many of which are LLDCs) because the U.S. had just begun assistance to these areas after the policy shift".[1]

EXAMPLE: Of the 52,500 student visas issued for training in Canada, over 60% of the students originate from 14 countries of which six are included in either the list of LLDCs or Most Severely Affected.[2]

1. Myer, R.B., Curriculum: U.S. Capacities, Developing Countries Needs. Institute of International Education, 1979, New York.

2. Neice, D., Braun, P., Patron of the World? - Part 1. CBIE, 1977, Ottawa

Such trends most seriously affect the LLDCs or those countries which are believed to have the weakest domestic training facilities.

Other Donor Agencies

An attempt to document the training activities and policies of other donor agencies proved more difficult than anticipated. Other agencies have often subsumed training activities within development or research projects and have not been able to disaggregate training elements.

Nevertheless, it is evident that some donor agencies have become more concerned about their training programs and are in the process of reviewing their policies. It appears that, at least in North American agencies, general training awards have been reduced in favour of training tied to specific projects that the agencies are supporting. Whether because of a shift to project funding or not, it seems that both the amount of funds and the number of individual trainees being sponsored are either being maintained at current levels or are being reduced.

Summary

There is extreme variability among countries in the availability of research scientists. Some countries appear to have a sizeable overall pool of researchers; others have considerable numbers only in some disciplines; others are seriously lacking in virtually all specializations. At the same time, some countries have dramatically increased their ability to train their own scientists or have at least begun to give some priority to research and research training while others have neglected the research sector altogether. In addition, although the number of individuals being sent for training in the more industrialized countries appears to have grown in recent years, the number of participating LLDCs trainees is minimal.

Finally, it also appears that major donor agencies are either maintaining or reducing the level of support given to the training of human resources and, because most are not exclusively involved in research endeavours, the level of support given to research training is believed to be very modest.

WHAT HAS IDRC DONE?

Magnitude of IDRC Training Support

Several sources of data were used to assess the magnitude of IDRC training programs, however it is difficult to quantify IDRC's training support. The two major avenues through which Centre training support is directed are the Fellowship Program and Divisional projects.

Fellowship Program

Average annual appropriations for the Fellowship Program (FP) have averaged between 4 and 5% of total Centre appropriations over the last 5 year period 1976/77 to 1980/81.

By the end of 1979, the Fellowship Program had sponsored 327 trainees of which 213 were from a LDC. Most of the remainder originated from Canada.[1] The largest number of LDC trainees in any given year was 56 in 1976.

Project Related Training

Two sources of data were used to assess the magnitude of project related training -- PINS and Division file searches.

1. Ten of the 115 trainees from a more industrialized country were recorded as being non-Canadian or not landed immigrants. However, some are believed to be Canadians resident in the U.S.A., U.K., Germany, or the Netherlands.

PINS Data

Data recovered from the PINS system must be used and interpreted very cautiously. PINS information reflects only those activities with a discrete training budget item in the Project Summary. Clearly, budget data does not reflect that which actually occurred. Furthermore, divisions have supported training which has not been identified as such in the budget and consequently in PINS. In some instances, even when an activity has been designed and budgeted as training, some of the associated costs have been included in another line item, such as travel. In other cases, projects have been designed as primarily training activities, and hence may not have a distinct training budget item which PINS could pick up. Finally, training that occurred under the Fellowship Program or was funded through other mechanisms (~~PAPs~~/DAPs) has not been included in the PINS system.

Bearing such deficiencies in mind, PINS nevertheless indicates IDRC has spent slightly over $12 million on project-related training with over 1/3 of all projects having some training budget item (Table 3). Although both the proportion of projects with an identified training component and the value of training have increased, expenditures in constant dollars on training activities have actually decreased between 1970 and 1980.

Table 3. Summary of Project Related Centre Training Activities as Recovered from PINS (1970 - 1980)

NUMBER OF PROJECTS	1970/75	1976/80	1970/80
Number of Projects	352	555	907
Number of Projects with Training item	118	211	329
Percent of Projects with Training item	33.5	38.0	35.7

VALUE OF PROJECTS	1970/75	1976/80	1970/80
Value of Projects ($ million)	67.9	96.9	164.8
Value of All Training items	4.2	7.8	12.0
Percent Value of Training items to Value of all projects	6.2	8.0	7.3

SOURCE: PINS

Combining PINS data indicating budgeted expenditure on training of $12 million with the Fellowship Program expenditures in training and allowing for a conservative error of 20% to cover training not captured in PINS data, it would appear that the Centre has budgeted in excess of $20 million toward support of training. Using the same calculations it would appear that Centre expenditure on training represents approximately 10% of program appropriations.

Since PINS does not record the number of people trained, a surrogate estimate was attempted. AFNS files indicated that the average cost of each training activity (including similar proportions of formal and informal types) approached $9,300. Although AFNS costs may not be representative of the average for project related training in other divisions, it is the only gauge that was found. Applying AFNS cost data to average annual Centre-wide expenditure, it would indicate that IDRC has supported no more than 200 trainees from the LDCs per year within the project framework.

Division File Search

A second assessment of the magnitude of project related training was attempted through file searches, which was possible only in AFNS. Since AFNS has the largest budgetary expenditure of any division and a high proportion of their projects contain a training element, it is probable that the division is the single largest source of training activity within the Centre, at least of the training activities involving more than a month of full time training.

According to the Project summaries AFNS had budgeted approximately $7.0 million for training activities.

AFNS Project Summaries indicated that 1,111 individuals were to receive training (Table 8). Assuming the same average AFNS training costs applied to all Centre training identified in PINS and adding FP awards produces an estimate of slightly more than 2,000. By adding in other identified trainees not included in PINS data, it appears that the Centre has supported training of various kinds for nearly 3,000 individuals.

Summary of the Magnitude of IDRC Training Activities

Since there are considerable gaps in the data, it is only possible to roughly estimate the magnitude of Centre supported training. Using the best available evidence, it is probable that IDRC has spent approximately $20 million on LDC training between 1970 and 1980. During this same period of time, it is likely that not more than 3,000 people have received some sort of training under IDRC auspices.

Clearly, in the global context, IDRC training support has been miniscule, although in certain fields of study and possibly at certain levels of training, the Centre's contribution is believed to be significant.

Divisional Approaches to Training

The divisions have tended to design and support training programs and emphasize certain types of training which are thought to best meet the needs of the recipient. The purpose of this section is to provide a brief description of the various training approaches and to discuss those issues considered important by divisional staff.

Fellowship Program

The function of the Fellowship Program (FP) has been and is to "develop the individual competence of high-level manpower in the field of international development, both in Canada and in the developing countries".[1] The FP was established in 1971 because it was believed that "there are some areas of science and technology which are not covered by the existing (program) divisions and as such IDRC should have a distinctive training program which is complementary to the more operational types of training (found elsewhere in the Centre)."[2]

Within the FP, training is perceived as being "any improvement in one's knowledge or skills which is acquired with the help of a supervisor or teacher or self-acquired with the use of written documentation or other mediums. The training could range from a few weeks to a few years. It could cover all areas of activities from sophisticated science to low technology".[3] More recently, FP awards have generally been aimed at shorter term, upgrading courses for younger or mid career professionals. The FP has offered several types of awards (see Table 4).

1. A. Rix, L. Rohonczy "A Review of Human Resources Program" July 1978
2. L. Berlinguet, November 1979 memo
3. Ibid.

Table 4 Distribution of FP Awards (up to end of 1979)

TYPE OF AWARD	NUMBER	PERCENT
Professional Development* (Developing Country)	105	32
Professional Development ** (Canada)	72	22
PhD (Canada)	42	13
Post Project	39	12
Pre Project	35	11
PhD (Developing Country)	15	5
Pearson Fellowship	12	4
Unclear from data	7	2
	327	100 (1)

* formerly Research Associate Developing Country Awards

** formerly Research Associate Canada Awards

Over the past year, there have been several changes in focus on specific FP awards, notably:

A. Because of the length of time needed to complete the awards, the relatively high cost, the growing concern over the relevancy of the training, PhD Developing Country awards have been terminated. For similar reasons, plus the fact that there is a serious decline in demand, PhD Canada awards were terminated in 1980. However, because of increasing pressure from within the Centre and from the Canadian university establishment, the awards may be resuscitated.

B. In recent years, Professional Development (Developing Country) Awards have been restricted to candidates who have been working in their home country for a number of years but have had few chances for study or research leave abroad. Support in future, will be redirected more into

Specialized Training Programs in collaboration with the program divisions. However, it is expected that such training activities will cater to cross-divisional endeavours or to those activities for which the divisions have specifically requested assistance.

C. Due to increasing demand, more support will be offered for Pre Project Awards but the length of tenure will be restricted to 12 months. This reflects a reduction in the average length of tenure which was 25 months per award in 1975 but varied from 5 - 6 months in 1979 and 1980. Furthermore, because in the past some Pre-project awardees did not return to a research project, awardees will be more rigorously selected to guarantee that most do return to a research project.

D. Post Project Awards will also be restricted to training of 12 months or less, to candidates who have actually been involved in a Centre project and to individuals who are young enough to make a contribution to the research community.

E. Various other awards, such as Research Management Awards and Support for trainees at the Hague Academy of International Law, have been or are being supported by the Fellowship Program.

In addition to these changes, several more trends within the FP are noteworthy.

First, the FP will place more emphasis on awards which complement the program priorities of the Centre.

Second, assuming the existing administrative structures persist, the FP will continue to shift support away from Canadian trainees toward LDC trainees. Over the past 10 years, approximately one-third of all FP awards

have gone to trainees from a more industrialized country. Within the last 3 to 4 years, the proportion has dropped to just over one-quarter.

Third, even though there is no clear evidence that trainees who have completed their studies subsequently fail to return to their home country, the FP staff believe that there is a need to ensure that awardees come from a particular Third World institute and also return to the same or a similar institute. Consequently, although awards will still be given to individuals rather than to institutes, the trainees should have some established affiliation with a facility in their home country before being offered an award and there should be some intent by the trainee to return to his or her home country or institute after completing the study.

Fourth, the FP will attempt to give preference to trainees from countries or institutes most in need of assistance. Obviously, there are limitations to this as many FP awards are linked to the activities of the program divisions (e.g. Pre and Post Project awards).

Table 5 Distribution of FP Trainees by Country of Origin

Country	Number of Awards	Percent
Guyana	12	4
India	12	4
Malaysia	12	4
Egypt	12	4
Colombia	10	3
Nigeria	8	2
Sudan	7	2
All others	6 or less	less than 2
More industrialized countries		35
Less developed Countries		65

Fifth, the FP will attempt to encourage training at local or regional LDC institutes in preference to training in more industrialized countries. Where no appropriate local or regional facilities exist, Canadian institutes will be considered before other high-income countries, provided the course content and anticipated results are comparable.

Table 6 Geographical location of Training

Location	Percent of all FP Trainees (no. 327)
U.S.A.	17.6
Canada	15.4
U.K.	11.9
LDC	13.4
Several locations	27.5
Other more industrialized	5.1
Not specified	9.1
	100.0

AFNS Division

Since over 60% of all AFNS projects have some identifiable training component (from PINS), training is obviously an important activity within the division.

In AFNS, the justification for training is straight forward -- "the Centre is in the 'business' of financing research projects using trained indigenous scientists, and, since there is a serious shortage of trained researchers in most developing countries, it is felt that the division has a responsibility to help fill this void".[1]

1. G. Bourrier, divisional statement, November 1979.

While over half of all AFNS supported training was of a non-formal non-degree type, the division contends that the more formal degree type of training (particularly Masters level) is crucial to increase the research capability in the agricultural sciences. This belief is also supported by many of the trainees' supervisors at Canadian universities although most also recognize the need and utility of shorter term, specific skill building programs.

Table 7 Planned AFNS Training in Project Summaries

TYPE OF TRAINING	NUMBER	PERCENT
Diploma	91	8
BA/BSc	11	1
MA/MSc	308	28
PhD	56	5
Study tour/Short Course	513	46
On-the-Job	132	12
	1,111	100

While recognizing the risk that formal overseas postgraduate training can keep the awardee away from the project for most of its duration, AFNS feels that even a relatively short-term project does not necessarily exclude the trainee from future contributions to a second phase of a project or from contributing to research in the project subject after IDRC support terminates.

Although a considerable number of AFNS trainees have studied in a more industrialized country, the division attempts to minimize the inherent risks of overseas training by linking formal degree training (particularly MSc degrees) to home based research topics and/or to home based field research. In some instances, the Division has funded a supervisor to visit the student in their home country to provide guidance while the student is doing field research.

AFNS has placed relatively little importance on PhD training, and there appears to be a trend away from this level of study. The major reasons given by AFNS are the high costs of PhD training and the fact that the trainee is usually away from the project and particularly his home environment for periods exceeding three years. Between 1972 and 1979, the average cost of a PhD award within AFNS was about $23,000 compared to $15,000 for a Masters award. In more recent years, the division calculates that PhD degrees cost in excess of $36,000 if taken in a more industrialized country.

The division has taken advantage of the usually excellent training facilities available at the International Agricultural Research Centres to send trainees there for short courses with nearly 20% of AFNS trainees going to these centres for courses usually of less than 6 months duration.

There is some concern within the division that training has been concentrated on too few countries and the relatively better endowed countries. Division files indicate that 8% of all AFNS awards were given to Malaysian students, 8% to Thai students, 7% to Indonesian and 6% to Philippino students. Yet, it also is clear that AFNS has been relatively successful in supporting trainees from the LDCs with 23% of all planned training awards going to African students.

There is considerable discussion within AFNS concerning the amount of training which should be included within a project. It is believed that if the training component is too large, the research effort may suffer or the project may simply become a vehicle for training. Although some projects may not be termed 'primarily training', there are examples from within AFNS where training is the major activity in a project.

TRAINING WITHIN THE HEALTH SCIENCES DIVISION[1]

In the past few years, the Health Sciences Division has operated in four research areas: Tropical Diseases; Fertility Regulation Methods; Rural Water Supply and Sanitation; and Rural Health Care Delivery. The PINS data show that 28% of the projects within the Division between 1970 and 1980 (47 of over 169) had budget line items under training. This only picks up part of the support for both formal and informal training which the Division provides. The following types of activities are considered by the Division to have a training element:

(i) Formal courses at a recognized educational institution. These activities are supported before, during or after a project. If the training is a pre- or post project activity, the Division usually requests support through the Human Resources Fellowship Program.

(ii) Workshops. These are often aimed at increasing the knowledge of researchers in particular subjects. They are supported through project budgets in most cases, but are occasionally funded through a DAP if the work takes place prior to formulation of specific projects.

(iii) Research projects. Some of the smaller research projects are considered primarily as training exercises in that they provide researchers with an opportunity to gain experience by going through all the steps involved in the research process, from proposal development to submission of final report.

(iv) Consultant visits and site visits are often used to provide informal, short-term, on-site training in specific skills.

1. This summary has been prepared by the Health Sciences Division.

(v) Inclusion of students in projects. Researchers in projects are encouraged to include graduate students to assist in somce aspects of project work so that the latter can gain practical experience.

In general, formal training awards (through pre- or post project awards) are directed towards encouraging young researchers who have done well in a project to continue in research by providing the opportunity to strengthen their skills and acquire the formal background needed to establish themselves in the research field. Informal or short-duration training activities during the course of a project are directed towards strengthening specific skills of researchers so that adequately qualified manpower will be available for carrying out the research.

The Division does not see IDRC's role as one of becoming involved in training to alleviate the general manpower shortage of scientific personnel at the postgraduate level in research. Rather, training is perceived as being specifically related to research activities in the areas of health that IDRC is funding -- by the way, this in itself is a broad field, as health covers many disciplines.

PhD training has not been encouraged within the Health Sciences Division as this leads to overspecialization which in most cases is irrelevant for the conditions which exist in many developing countries and the level of research that IDRC supports in health. The Master's qualification is adequate for most of the field projects that are supported by the Division. The only exceptions that can be made are in instances where:

1. the person needs in-depth knowledge to undertake research in his field;
2. the individual is being prepared for a post of heading up an institution or other important government position.

Over the years, training has become an increasingly important part of the Health Sciences Division's activities. Most projects now include a component (formal or informal) to increase the skills of at least one member of a project's research team. The amount of training provided through or after a particular project, however, varies depending on the capabilities of the research team, the sector and the region.

The question of how best to disseminate information arising from research results has been a contentious point within the Centre since it began operation. Publications by IDRC, articles and journals related to topics of study, films, workshops and seminars have been used with some success. However, in the field of applied technology, these approaches have limited impact, as in many cases this type of information does not percolate to the people who are likely to use it; that is, training institutes for medium to low-level personnel which are in the long run the providers of service. The situation is particularly acute in the water supply and sanitation field but also applies in other areas of health. Application of many of the new innovative technologies go unnoticed yet this is the prime focus of much of the research effort.

Is it time for the Centre to be looking at developing a program in training in which the results of research not only from IDRC but from other research sources are taken and implemented into training institutes in developing countries? This could be done by offering these institutes help in rethinking their curricula and broadening it, if necessary, to include other subjects which tend to be ignored at present but which may impede implementation and acceptance of technologies or new innovations. Another aspect would involve retraining of the trainers but at their own institutes rather than abroad, to ensure that suggested changes are relevant to the situation in which they function. This would require the placing of expertise full-time

in an institution for periods of two to three years. This is basically technical assistance but the research aspect could be developed by looking at the performance of the newly trained personnel of the institution over a period of time. In this approach there could be a place for regional training in the developing country institutions but it would be limited to selected personnel from country institutions.

In summary, the Health Sciences Division sees the following training issues:

1. How do you get research results which show that new approaches, both technical and social, need to be implemented, into the training of new cadres of middle and low-level personnel?

2. The IDRC should restrict training for the improvement of research capabilities to specific program areas of the Centre. This type of training should be directly related to projects and should focus on the upgrading of specific skills for researchers already on the job. It should not attempt to alleviate overall manpower shortages and, therefore, should not be generally involved in funding basic PhD level training overseas.

Information Sciences

According to PINS, only about 30% of IS projects have a budget item identifiable as training which under-represents the real situation. Many IS projects involve training activities that were not evident as such in the budget breakdown: for example, allocations identified as 'travel' often were for the purpose of permitting the recipient's staff to go out from the headquarters of an information network and to conduct training seminars at other nodes in the network.

A contrast must be made between the work of the other programs divisions and the work of the IS division. The other program divisions, by supporting research, help to produce the new information that is needed for development. The IS Division is concerned with helping the developing countries to organize

existing information, both new and old, so that it can be delivered conveniently when required. The services constructed with the help of IDRC grants are aimed at meeting the information needs of scientists and technologists, planners and government officials, entrepreneurs and, in a few cases, the general population.

To these ends, the IS Division has supported a diversity of programs, of which the principal ones are:

(1) The development of international and regional systems which, by cooperation among the members, produce indexed inventories of available information (the largest investments have gone to support developing-country participation in AGRIS - a cooperative system which makes an inventory of information in the field of agriculture).

(2) The development of information analysis services on specialized topics; these services are located within organizations that are themselves 'centres of excellence' for research into these topics (for example, the Cassava Information Centre at Cali, Colombia).

(3) The development of industrial extension services to carry technical advice to small and medium-size industries (for example, the TECHNONET program in Southeast Asia).

(4) The development of services that will stimulate and inform animateurs working at the grass-roots level in developing countries (for example, the question-and-answer service operated from an institution in Abidjan).

(5) The introduction of low-cost methods of producing maps needed for development purposes (i.e. the use of data from satellites).

(6) The development of computer software, indexing tools and methodologies for application in any of the above systems.

Given the diversity of this program, the training components have also been widely varied. The Division has sought those solutions to the training problem that will give quick results at low cost. For example, it has cooperated with FAO in the conduct of two-week training seminars which will equip a documentalist with virtually all the skills that are necessary to become an effective participant in AGRIS. It has provided for extensive travel by the senior staff of INFOPLAN (the planning information system for Latin America) so that these individuals could go out to the participating countries and train the teams that will identify the information for input into INFOPLAN and extract the output needed by their planning ministries. Such intensive short courses are seen to be the most effective of all the training mechanisms used by the Division.

Where the Centre itself produces the tools for information work, short courses have often been conducted in Ottawa or by IDRC staff going out to the field. Currently the Centre itself manages a significant program of short-term training in the use of MINISIS - the computerized information-processing programs that were produced in Ottawa. Similarly, the IDRC Library has a unique experience with the methodologies that are internationally recommended for small and medium-size libraries concerned with socio-economic development issues. It too is sought out as a place for training librarians and documentalists from the developing countries (often under the auspices of other donor organizations).

For the cartography activities, somewhat longer training courses were needed, and the only ones available were those in the industrialized countries (United States, Canada and France). In general, however, the few schools that can teach the methods of exploiting satellite data for map production are accustomed to working with foreign students. The Division welcomes the establishment of new such schools in the developing countries - for example, the one at Ouagadougou.

For the specialized information services, one perceives a need to develop a few individuals to a high level, and it is in this connection that the Division has made occasional use of the Masters Degree programs in industrialized countries. These are costly and must be used with considerable caution, (it is all too well known that this mechanism often succeeds only in promoting the brain drain). Shorter, more intensive, but still formal training, can be effective in raising the horizons of the individuals concerned; the Division has made some use of the programs lasting 2 - 3 months that are operated by Unesco and by the University of Wales.

TECHNONET Asia now conducts its own training programs for industrial extension workers, but initially, large groups were sent for training in India and a few key individuals were brought for training in the industrial extension services operated in Canada.

Occasionally, particular technical training, e.g. in microphotographic techniques, is required and the Centre has had some experience in providing what are essentially short-term apprenticeships, both in developing countries and in Canada; a good example is the training that was provided for the several members of the production team of Famille et Développement.

The Division uses training facilities in industrialized countries only with great reluctance. While it must respond to requests for

training in IDRC facilities when no other such facilities exist, it also seeks to ensure that these facilities will eventually be duplicated in the developing countries. Thus, for example, it has supported the establishment of an ISIS Resource Centre at Cartago, Costa Rica, where potential Latin American ISIS users can get the necessary training without coming to Canada. It expects to help the development of MINISIS resource centres that will similarly relieve the load in Ottawa.

The Division also believes that it should give more attention to the development of appropriate educational facilities in the developing countries themselves. It has had one encouraging experience in Mauritius where, with the help of IDRC, the University established a part-time certificate course for individuals who were operating libraries but who had had no previous training in librarianship. Expatriate help was given in the development of the curriculum and its testing, but the course is now entirely run by Mauritians. Several other countries have looked at the Mauritian experience and may be using it as a model in starting courses of their own.

It is true that probably the greatest training needs are to produce a large number of effective practioners at low and intermediate levels. The developing countries have so many other calls on their more highly educated people, that they will achieve progress only if they can make effective use of those that have been less well-endowed.

But for leadership, they also need to be able to train a number of more highly educated individuals to an advanced level of information science. If they are not to lose some of their best people, and if they are to develop solutions appropriate to the situations in developing countries, they cannot go on depending entirely on schools in Europe and North America. It was for these reasons that the Division worked on a proposal to support

a regional post-graduate program in information science based at the University of the Philippines. This proposal was rejected by the Governors at their meeting in Nairobi in 1977. Fortunately, about a year later, other donors did fund this activity and the new program has now produced its first set of graduates. The faculty is a mixture of Asians and expatriates, and is progressively becoming more Asian. Similar programs are badly needed in other parts of the developing world, particularly Anglophone Africa: when appropriate, the Division would like to re-open discussion of such activities with the Board.

Social Sciences Division

Probably more than for any of the other divisions, PINS data seriously underestimates Social Sciences' involvement in training in that only about 14% of the projects had some discrete training budget item. Training, as interpreted in the division, includes a number of activities which are incorporated into projects but which do not appear in the budget summaries (e.g. apprenticeships of junior researchers). Furthermore, the division has been involved in primarily training projects (to a greater extent than other divisions), which obviously do not have a separate training item in the Project Summary.

Rather than supporting trainees in a more industrialized country on a formal training scholarship, the division has tended to concentrate on training activities within research projects and within the LDCs. In both single location projects and in multi-country networks, meetings have been used as a training tool to increase knowledge of individual researchers or of country teams. In network projects with teams at different levels of expertise, workshops have been regularly used as vehicles for training and for sharing and acquiring different skills at various stages of the project. During the initial workshop or

project identification meeting, conceptualization skills are refined. Subsequently, one or more methodological workshops are planned wherein researchers design, adapt, and improve skills that are required to undertake the research with a given methodology. Finally, monitoring and reporting workshops are scheduled where analysis and report writing skills are improved.

The division firmly believes that training is an important and vital activity of project development and consequently has funded several programs which could be considered as 'primarily' training projects. These projects have been categorized as:

A. Support for the development and operation of formal training short courses (e.g. IDRC/SPRU Training Program), particularly in new subject areas.

B. Support for scholarship programmes for individuals which are administered by an intermediary organization (e.g. Regional Research and Training Programme --ADC).

C. Support for on-the-job research training through both individual research grants to junior researchers (Southeast Asia Population Research Program) or through training as part of a larger research project (e.g. Council for Asian Manpower Studies).

Although other divisions have been involved in projects which are primarily training, the Social Sciences Division has had the broadest range of experience. Given the importance of these kinds of projects, a major section is devoted to a discussion of these in the issues section of this paper.

In sum, Social Sciences has supported many types of training but has tended to emphasize workshops, on-the-job training of junior researchers, small research grants to inexperienced scientists, and primarily training projects. Due to past administrative links, much of the more formal types of training that have been supported by Social Sciences were incorporated in the Fellowship Program.

Summary

While there are certainly differences in approach between the divisions, they are less than those assumed by many staff in the Centre when the study began. Some of these differences are dealt with in the remaining sections of the paper which address a number of issues common to all divisions, such as the source of trainees, location of training and the merits of different kinds of training.

The study team refers to the comparative advantage of the Centre in a number of places in the remaining sections and it may be useful to clarify this term before beginning the issues section.

The exclusive focus of the Centre on supporting research and its policy of providing support to research institutes on a project-by-project basis allows IDRC to identify, in collaboration with the institution, the most critical training requirements of the individual researchers and the research team as a whole. The flexibility enjoyed by the Centre in terms of the type of training that can be supported allows it to tailor training needs in the most appropriate way. Thus the Centre has employed a wider variety of methods, particularly informal short-term training, than other agencies appear to have.

Other agencies have both the resources and the mandate to train manpower in general formal training programs but seldom the capacity

to tailor training to individual requirements as can IDRC. The issues section expands on the comparative advantage of IDRC by suggesting that the Centre emphasize short-term informal training.

The remaining sections of this paper review a number of Centre-wide issues such as the source of trainees, the location of training, and the merits of specific kinds of training.

HAS IDRC TRAINING INCREASED RESEARCH CAPABILITY?

While the study cannot provide a definitive answer, there are a few indicators which help to point to some conclusion.

There does not appear to be any movement away from research work as a result of Centre training. When Trainees were asked to specify the type of job they held immediately prior to their training and immediately after completing their training there was very little difference between the proportion involved in research either before or after training. In a longer term perspective, the situation may differ.

In all three questionnaires, respondents were asked to rate how closely the Centre training programs complied with the goal of increasing research capability (Table 8).

Table 8 HOW PROJECT LEADERS, SUPERVISORS, AND TRAINEES RANKED TRAINING IN MEETING THE GOAL OF INCREASING RESEARCH CAPABILITY

R A N K	PROJECT LEADERS Percent	TRAINEES Percent	SUPERVISORS Percent
Completely	33	41	26
Nearly	39	31	50
Slightly	11	15	7
Not at all	0	3	0
No opinion or response	17	11	17
	100 (n72)	100 (n396)	100 (n88)

EXAMPLE: From the Mali country profile: "What has been done (by IDRC) is important and what remains to be done is enormous. Nowhere in Africa has the centre been able to tackle the problems as well as it has been able to do in Mali. IDRC scholarship holders hold very responsible positions".

Source of Training Awards

Training awards tend to be highly concentrated on certain countries and geographical regions. Almost 10% of the trainee respondents to the questionnaire originated from the Philippines alone. Egypt and the Sudan were the only non-Asian countries in the 10 largest recipients of identified LDRC awards. Excluding Canadian trainees, 53% of FP awards were given to trainees from 15 countries with 10% of FP awards going to LLDC recipients.

Table 9

COUNTRY OF ORIGIN: Trainee Questionnaire

C O U N T R Y	PROPORTION OF ALL RESPONDENTS
Philippines	9.5%
Indonesia	7.4%
Malaysia	7.4%
Thailand	6.7%
Sri Lanka	5.9%
Bangladesh	3.8%
India	3.3%
Egypt	2.8%
Sudan	2.6%
T O T A L	49.4%

The explanation for this concentration of training awards is partly due to the pattern of Centre project support. Since research projects have been the main instrument for supporting training activities in the past, it is to be expected that the training pattern would more or less coincide with the project pattern.

Table 10 indicates however, that even taking project distribution into account, there are some anomalies in terms of training support directed to the least endowed countries.[1]

1. It would appear that the PINS data presented in Table 8 under estimates the extent of concentration of training, especially in Asia as most primarily training projects which are not captured by PINS data are based in Asia. In addition, PINS data includes more formal types of training which are most common in LLDCs.

The percent of project budgets devoted to training in the LLDCs has, however, increased in recent years so that it now slightly exceeds the average proportion for all Centre projects.

Table 10 TRAINING AS A PERCENT OF TOTAL EXPENDITURES IN EACH REGION

REGION	TRAINING AS A PERCENT OF REGIONAL EXPENDITURE 1970/75	1976/80	1970/80	VALUE OF CENTRE PROJECTS $ million	Percent
Centre-wide	6.2	8.1	7.2	164.8*	
Africa	7.3	9.6	8.7	34.8	21.1
Asia	6.4	11.6	9.1	48.9	29.7
Latin Am/Carib.	5.9	8.1	7.3	37.7	22.9
Middle East	10.7	8.4	9.1	12.5	7.6
LLDC	5.4	9.9	8.1	20.0	12.2

SOURCE: PINS

* Includes: Canada $6.6 million and Global $24.3 million which comprises 18.7% of the total value of Centre Projects.

The questionnaires and country profiles do not indicate that training awards in the better endowed countries have not been appropriate or worthwhile and there are no grounds for suggesting they be reduced. There is however a very strong support in these sources for increasing the level of support devoted to training in the LLDCs.

It is recommended that future training support be focused more on the LLDCs. The implementation of this recommendation implies either a similar shift in the project pattern, or an increase in the training component of budgets in the LLDC projects or a greater number of specific training projects being financed in the LLDCs.

Canadian Training

While the limited opportunities for Canadians to participate as directly as they would like in development work is clearly a problem for some, according to the questionnaires, the FP estimates that only 23% of the 78 award holders who have received support from IDRC, are not working in development related areas.

The establishment of the Cooperative Program by IDRC provides another mechanism by which Canadians can become more involved in development research. Given the apparent success of the IDRC awards to Canadians in terms of expanding Canadian interest and involvement in development issues, the real question becomes the level of support that should be provided for this program. Canadian awards have declined from more than 1/3 of all FP awards in the first few years to less than 1/4 of the total in the last three to four years.

WHAT FIELD OF STUDY SHOULD IDRC ENCOURAGE?

IDRC Support in Relation to Country Needs

The six country profiles and questionnaire responses indicate that the Centre's support is generally directed toward national research priorities and the training requirements which they generate. The profiles cannot, of course, be very specific in addressing country needs.

> *EXAMPLE: From the Indonesian country profile: "It is extremely difficult to get a coherent picture of national development priorities on which there is a consensus and which is sufficiently specific to provide the basis for individual project development."*

However there are some cases where IDRC training support is not directed to areas of high priority. The Philippines profile stresses the need to provide training opportunities to weaker provincial institutions but points out that 90% of IDRC's support is directed to institutions within 100 Km of Manila.

Skill Deficiencies

The questionnaires, profiles and literature all stressed the critical need to correct specific skill deficiencies to which the Centre has not a l w a y s provided support.

> *EXAMPLE: In the Egyptian country profile, although some research skills and specializations were singled out as being in very short supply (economics, multidisciplinary research methods, information specializations, etc.) only a few trainees in these fields of study have been supported through Centre*

training programs. Technician training is also deemed to be a priority among Egyptian scientists yet very few technicians have received Centre training support.

In the short term also, new fields of interest (e.g. agro-forestry, MINISIS) as specified by host countries might be entertained but they must be contained within existing program areas and should not be expanded in any dramatic fashion.

EXAMPLE: From the Philippines country profile: "It might not be advisable for IDRC to invest resources in new fields of activity so as to create a 'market' for them in the country. A better strategy would be to build upon a number of policy areas that are already receiving some attention such as appropriate technology, energy policy, cooperative urban development, and research management."

Skill Deficiencies

From the questionnaires, country profiles, and the literature, several specific skill deficiencies were repeatedly mentioned as needing improvement or attention

Data Collection, Laboratory Skills, etc.

The training of research support staff has not received the attention that many Third World scientists believe it should. Most country profiles

suggest that in countries where there are sufficient numbers of professional researchers, there is a critical need for more and better trained support staff. The efficiency of relatively scarce senior researchers could be greatly increased if there were trained and competent technicians who could complete tasks which senior researchers must now perform.

> *Example: Oram et al note that although the technician to scientist ratio ranges from 1.8 for the best of the eight LDC's the worst eight Third World countries have a ratio of 0.3 technicians per scientist and engineer.*[1]

> *Example: "The further training of non-academic research officers at the technical staff level is as important as the post-graduate training of academic staff. There are in Tanzania, aside from advancement from certificate to diploma level, no definite higher levels of non-academic training that research workers can be trained to, unless they complete a full university course. Adequate on-the-job training combined with specialized short courses are therefore essential if this category of research officer is to be expected to perform meaningful work. ... Data collection and basic calculations are very often partly or completely the responsibility of technicians and assistants and if these tasks are fouled up by untrained personnel, the whole experiment will have been wasted."*[2]

Therefore, it is recommended that the Centre give more attention to training support staff or technicians preferrably in their own environ-

1. Oram, P., Zapata, J., Albaruho, G., Roy, S. "Investment and Input Requirements for Accelerating Food Production in Low Income Countries by 1990". IFPRI Research Report 10, 1979
2. Klem, G. "Forestry Research in Tanzania, Problems and Possible Improvements" University of Dar es Salaam, 1979

ment. If in-country short courses or on-the-job training is not practical or feasible, the Centre might also consider assistance for the design and implementation of appropriate training mechanisms.

Methodological Skills (Design and Analysis)

Particularly for less experienced institutes, it is often necessary to upgrade the basic research skills of existing staff. The lack of good methodological skills was not reported in the questionnaires as a major concern among trainees and project leaders, yet there is some evidence to suggest that improved design and analysis abilities are needed for both inexperienced middle and senior scientists.

> *EXAMPLE: As reported in the Philippine country profile, social science researchers have been trained in the traditional arts and letters disciplines and are "woefully lacking in quantitative and analytical skills demanded by the 'new' social science. A few researchers have the methodological rigour and precision to use computers and advanced techniques in policy study but generally these types of skills are lacking. A number of young social scientists are conversant with these techniques but lack the knowledge and experience to properly interpret their findings, running the risk of applying sophisticated quantitative techniques to wrong research areas."*

When project leaders and trainees were asked to rank the prerequisites for increased research capability, the following were reported:

Table 10. Ranking of Prerequisites for Increased Research Capability

Prerequisite	Relative Weighted Rank	
	Project Leaders	Trainees
Post Graduate Training Awards	75	354
Basic Research funds	48	378
Improvement in Methodological Skills	11	69

However when the same people were asked what types of skills were best developed during their training or the training of their colleagues, research design and analysis were among those skills that were least fully developed.

Once again, it is recommended that the Centre should give increasing attention to the need for improving methodological skills for LDC researchers. Though the preferred method is not clear cut, it might best be done through a series of workshops or short-courses specifically related to practical research efforts within the host country or region. In many cases, the reference materials and case studies developed for the workshop or short course are extremely useful for individuals who were unable to participate because most have been designed within the context of specific research problems and within a familiar environment usually in a local language. Several methodological skill building models can be reviewed (e.g. Research Methodology Training Program, Indonesia) for additional insights into the improvement of abilities in survey design, sample selection, questionnaire construction, coding procedures and so forth.

Research Management Skills

Although opinions were mixed, some IDRC staff and many LDC contacts suggest a need for better research management skills. In the trainee mail survey, improving research management skills was ranked as the sixth out of 17 prerequisites for improved research capability in the LDCs. When awardees were asked to judge the opportunities they had to gain a variety of skills, those for training in research management were fewest, Similarly, project leaders noted that the opportunities to develop research management skills were least developed of all skills among the trainees with whom they were familiar.

For clarity, deficiencies in management skills may be categorized as:

A. Insitituional-wide skills which may include improved capability in budgeting, setting research priorities and so forth.

B. Individual project skills which may best be described as "how to get things done". Skills that might be needed are adaptable and flexible work planning, report writing, supervisory abilities, delegation of responsibilities and basic administrative and accounting knowledge. The best method of augmenting these skills is debatable but likely would include a combination of regional or country short courses possibly linked to some supervised on-the-job training.

Clearly the best method(s) has yet to be found but there is general agreement that there is minimal value for LDC scientists in taking formal postgraduate management degrees in a more industrialized country.

Other options should be explored. Clearly the experience gained by researchers in Centre supported projects, network workshops, IDRC staff and consultant visits and small supervised research grants have improved their management ability, although there has been no systematic assessment of the effectiveness of such activities in building management skills. The Centre has supported one project specifically designed to create management teaching material and a further review of this project would be useful.[1] Sending more trainees to management courses in LDC institutions might be useful in some cases.

Summary

Most Centre-supported training fits within priority research training requirements of the LDC's but there are some specific weaknesses in research and management skills. The Centre should consider broadening the kind of training provided in research projects or initiating specific training projects.

1. Research Management (Asia) SEARCA, 3-P-73-0068 & Phase II 3-P-77-0141

THE BEST LOCATION FOR TRAINING

The data available indicates that approximately half of the Centre supported trainees studied in an industrial country, although this likely overestimates the actual number.

Table 11 below provides a regional summary of the training location.

Table 11 Regional Location of Training

LOCATION	NUMBER	PERCENT
More Industrialized Country	209	49
Asia	143	33
Africa	35	8
Latin America	22	5
Middle East	13	3
Caribbean	8	2
TOTAL	430*	100 ( )

* Total exceeds 396 since some trainees studied in more than one country

The questionnaire results indicated this may not be appropriate. Although 70% of the trainee questionnaire respondents took all their postgraduate training outside their home country, only 23% thought this was the best location. Project leader responses were even more pronounced with only 11% agreeing that both theory and practice should be done exclusively in an overseas institute. There was however support for the idea of some overseas training with, for example, two-thirds of the project leaders selecting a combination of overseas and home country training as superior to taking it only in one location.

Conceptually at least, the location of training need not be an issue for the Centre if we identify training needs and try to meet them in the best possible way. There is, however, no consensus on what is the most

appropriate kind of training institution and environment. Three main issues were identified as relevant factors affecting appropriate choice of location.

Relevance of Training

Exposure to the better facilities, new technologies and ideas available in industrial countries was cited in many cases as justifying the need for overseas training.

> EXAMPLE: *The Philippine country profile noted that "a number of interviewees pointed to the continuing need to have Filipino academicians trained abroad to expand their spheres of knowledge and enrich their backgrounds. The danger of 'inbreeding' when Philippine trained faculty members predominate in Local institutions was cited."*

Others argued that the superior physical facilities and sophisticated equipment found in the industrial countries left the student ill-prepared to operate in his own environment. Lengthy specialized post-graduate training in the industrial countries was also cited as being inappropriate for the wide range of tasks a researcher has to perform in his own country.

The responses to the questionnaires did not indicate any significant differences between students who studied abroad or at home when they ranked the opportunities they had to acquire different research skills such as participation in original research, conduct of practical experiments or participation in data collection and processing.

Cost

The escalation of education costs in Europe and North America have lead many to argue against the use of these training facilities. One has to balance the number of people who can be trained in their own environment versus the quality of training they might receive in a developed country. The information collected during the study on relative costs of education in LDCs and DC is not conclusive, however, and a more detailed review of this specific question is required.

The Brain Drain

Some reports suggest that when trainees study away from their home country, they are more apt to take up permanent residence in their adopted country.[1] However, it is clear from the data collected for this study that the brain drain is not a problem for IDRC supported trainees. Less than 3% of IDRC trainees failed to return to their home country after completing their studies abroad, according to the trainee survey.

This favourable result may be due to the trainee's link to a research project. Candidates selected from research project teams are more likely to have established jobs and return to a job which relates to their training.

Selecting Training Institutions

Whatever the location of training, the responses indicated that trainees were not always happy with the choice of institution or the information they had available before choosing. Over one-quarter of the trainee respondents thought that they should have more information and advice before selecting the training institution and 35% of those responding to the question thought that a different subject or institution should have been chosen. Since IDRC program staff and the trainees project supervisors were rated as the most influential source of advice, it appears that the Centre would be justified in devoting more effort to identifying and becoming knowledgeable about training facilities and capabilities in the program areas where it supports training.

Furthermore, it was noted that supervisors at training institutes were not necessarily chosen for their knowledge of the Third World or for

1. See Glasser, W. "The Brain Drain, Emigration and Return" UNITAR, 1978

their familiarity with the research project. Virtually none of the supervisors interviewed at Canadian universities were familiar with the project in which the trainee was involved and only a few had any first hand knowledge of the trainees' country and its problems.

Summary

It is recommended that:

A. Centre-supported trainees should be encouraged to undertake their training in their home country or other regional training institution whenever facilities of adequate quality are available.

B. Where no appropriate facilities exist in either the home country or in the region, then every effort should be made to enroll the trainee in an industrial country institution with a similar research environment where the supervisor is familiar with research problems and conditions in the trainee's home country. Emphasis should be given to home-based field research and facilities.

C. In view of the creation of the Cooperative Program and the greater ease of monitoring and support, Canadian institutions when adequate, should be given preference over other more industrialized country institutions.

D. The Centre should give more attention to searching out the most appropriate training facilities available, particularly within the LDCs.

WHAT ARE THE MOST EFFECTIVE TRAINING TYPES AND PROCEDURES?

IDRC has funded trainees through a variety of means. Inevitably no single approach is preferable in all situations.

Table DISTRIBUTION OF RESPONDENTS BY TYPE OF TRAINING

TYPE OF TRAINING	Number of Respondents	Percent
Masters	86	22
PhD	64	16
Non-degree formal short courses	51	13
Non-degree on-the-job	38	10
Otherwise not specified	37	9
Non-degree study tour	30	8
Non-degree independent study	28	7
Non-degree informal short course	19	5
Thesis research only	19	5
Postgraduate diploma	8	2
Undergraduate degree	5	1
No Response	11	3
T O T A L	396	100

The best procedure will depend on the situation and the specific needs of the trainee and the research institute. Hence, it is crucial to clearly determine the knowledge and skills required to select the most appropriate training program.

Few, if any, of the various types of training provided by the Centre are inherently weak. In most instances problems with different types of training occurred not because of a poor match between learning objectives and the method of training, but rather from faulty procedures and plans used to implement the training.

Nevertheless, from the sources used in this analysis, the following

general comments may be useful guidelines for determining in which situation a given type of training offers most potential.[1]

Formal Undergraduate

IDRC has supported relatively few undergraduate degree or diploma students (less than 2% in either case). In most instances support and appropriate training facilities are available in-country and host governments/institutions should be encouraged to provide support for diploma and bachelor level training.

However, there are a few cases where the Centre might consider support for diploma or undergraduate degree training:

A. A few diploma level courses cater to improving data collection and analytical skills and consequently may have some merit for junior technicians.

B. Diploma training may be the most appropriate type in situations such as that found in the IS Division where training is not intended to build specific research skills.

Postgraduate Degrees

IDRC has supported a significant amount of formal postgraduate

1. Standard North American nomenclature is used throughout this section even though Spanish and French terminology may have slightly different meanings.

training during the past 10 years. Twenty-two percent of the respondents to the trainee questionnaire had received Masters training and 16% PhD training. The study team has argued elsewhere that the Centre has a comparative advantage in supporting short term project-related training, especially in new subject areas and in new technologies. This does not however negate the very real value of support for formal training, as attested to both within and outside the Centre. Indeed, postgraduate training is ranked as the first or second most important prerequisite for increasing research capability by IDRC trainees and project leaders. The country profiles also note the continuing demand for formal training.

However, there are several reasons why PhD training in particular is being questioned within and outside the Centre. As noted elsewhere, the cost of most PhD training is relatively high. The length of time needed to complete a PhD degree (often 4-5 years) limits the trainees' involvement in a Centre funded research project. In addition, PhD trainees are less apt to successfully complete their studies than are other awardees.

Approximately 16% of PhD respondents to the trainee questionnaire, failed to successfully complete their training. In comparison, less than 5% of most other types of trainees failed to complete their studies.

Although some individuals interviewed during the study argued that only through PhD training could an individual be expected to become an 'independent' researcher, other interviewees recognized that, in many instances, a Masters level program might result in comparable skill development, if properly designed, at less cost and over a shorter period of time. In addition, Masters programs seem to be somewhat more flexible than PhD degrees in that a greater variety of courses are available. Finally, specific to IDRC, Masters training tends to be more compatible with IDRC project time limits.

In sum, there are obvious and good reasons for the Centre to continue support for postgraduate level training, but it is recommended that wherever PhD training is being considered, the relative merits of providing Masters level training instead should be carefully assessed.

Less Formal Training

Not all trainees have the same skills and knowledge needs and it is not always necessary to acquire all skills through lengthy formal programs.

In many countries there are already numerous researchers without formal postgraduate degrees (let alone BA/BSc degrees).

> *EXAMPLE: In 1978 consultancy report to Sri Lanka, it was reported that out of 108 research officers in agriculture, 14 had PhDs, 28 had Masters and 64 had no postgraduate degree whatsoever.*[1]

> *EXAMPLE: "In Colombia, as in most other developing countries, one frequently encounters competent, skilled individuals who not only display strong conceptual and analytical abilities, but also have mastered a research methodology - all without however being 'certified'".*[2]

1. L.R. Wallace, "Reorganization of National Research, Extension and Training Resources for Agriculture", Report on Consultancy Mission to Sri Lanka, May 1978, p. 19

2. B. Toro R. Campo, R.G. Nyers, "A Critique of 'Increasing National Capacity for Educational Research, Issues, Dynamics and Alternative'" by Sheldon Shaeffer, Nov.1979, (RRAG) p.5

The fact that numerous researchers are presently functioning without formal post graduate training suggests that these individuals have acquired the necessary skills and knowledge by other means. Hence, it may be more efficient to isolate specific skill deficiencies and correct them in ways other than through long and costly post graduate training programs.

Skills required for research work tend to be defined in terms of formal training qualifications rather than actual demands of a research project.[1] It is probable that certain skills such as those in survey methodology, statistics and research design can be gained more effectively through various types of on-the-job training and through intensive well-designed workshops rather than through the more abstract and diffused process of formal training.

As noted earlier, consideration of the amount of cultural specificity in the research process has led to a debate on the utility of some research methodology particularly that imparted in a more industrialized country context. Attempts to work within restricted and specific cultural settings have led to experimentation with participatory research or the involvement of the research subjects in all stages of the research work.[2]

1. David Court, Pablo Latapi, "The Research Process", IDRC-MR6, Paril 1970, p. 11

2. David Court, "Respondent Comments: 'Strengthening national capacity to carry out and apply educational research. Experience from the 1970's'", Bellagio Workshop on Education, 1979

The participatory approach has shown that people with very little formal education can become directly involved in conducting controlled experiments relating to their own environment and can even learn to complete rather complex statistical computations without any previous formal training.[1]

Even if formal degree training has been received the researcher will need continuing training to increase and realize their potential productivity.[2]

1. Case study in participatory research presented to the conference of the International Council for Adult Education, Yugoslavia, 1980

2. B. Rexed, "The Role of the University of the Research Institute in the 'Scientific Training of Research Workers in Training of Research Workers in Medical Sciences'". Geneva WHO 1972, p. 23-25

In sum, the alternatives to formal post graduate training are often attractive because they can be concentrated on a few specific skill needs, are usually less time consuming, may be less costly and can be more easily adapted to the individual trainee's needs. However, it must be stressed that widespread use of less formal methods will undoubtedly be more costly for the Centre and will require more person-years and more creativity to design, implement, and monitor.

A brief description of these alternatives to formal university training follows.

Short Courses/Workshops

Over the past ten years, a considerable proportion of Centre training has been of the short course variety. Short courses are advantageous in that project staff are not away from their job for extended periods of time, they can be quite cost effective, they can cater to specific needs of groups of individuals, and the time between training and the utilization of training is short. However, if they are not carefully planned with a training goal in mind, short courses and workshops may have little impact.

> *EXAMPLE: From the philippine country profile: "Project staff like short term (training) grants because they do not demand serious preparation or intellectual application--and they look nice on one's curriculum vitae. Local seminars and workshops are so common they act like a smokescreen--they give the semblance of frenetic activity while they actually accomplish nothing. When pressed for specific knowledge and skills gained from short-term grants, many interviewees admitted, off the record, that no significant learning took place. The experience, however, was interesting and most expressed a strong preference for short-term (training)."*

In addition, some short courses are not recognized for career advancement purposes in many LDCs and consequently participants may not be overly enthusiastic.

Short courses are particularly appealing if they are already established to meet clearly identified needs. However, where no relevant courses at the local or regional level are available, then the Centre may find it appropriate to support and help design, monitor and/or implement such training endeavours.

As unique Centre initiatives, a number of factors should be considered.

A. Funding innovative short courses and workshops dictate more staff development and monitoring resources than funding an individual trainee in an established formal program. Important pedagogical skills are also necessary.

B. The development of new teaching materials for the short course and workshop may be the most valuable outcome of the course.[1] The Centre should make the material available for wider use.

C. Although short courses may have advantages for certain kinds of skill upgrading or in training research technicians, there has been little systematic evaluation of different methods to suggest the most appropriate skills to transfer and the most cost effective format. Consequently, the evaluation component of any workshop and short course is crucial.

1. Norman Girvan and Norman Clark "OVPP Evaluation Report on the IDRC/SPRU Training Program", IDRC 1979, p. 35-37

EXAMPLE: Out of the array of courses supported by different agencies some types of training have been more useful than others in alleviating this situation, yet, our grounds for assessing the relative contributions of different types of training to the provision or required types of skills remain subjective and fragmentary."[1]

Informal On-the-Job Training

Nearly all Centre supported projects provide some kind of on-the-job training. Three types of research training have been used:

a. Placing junior scientists under the direct supervision of senior personnel in a large research project. The junior researcher has the advantage of working on a day-to-day basis with a senior colleague and of learning how to function as part of a larger research project;

b. Including a junior team within a large network of coordinated research projects. In such a way, technical assistance can originate from both the network coordinator and from more experienced team through workshops, study tours and so forth.

c. Providing individual awards to junior people working on independent but related research problems. The individual can undertake each step in the research process and carry it through to completion.

In most cases, working in a research project can provide a useful learning experience but the benefit from this can certainly be improved if the project is designed to achieve the objective of transferring

1. David Court, Comments to Bellagio V, OPAT, p.g.

specific knowledge and skills to junior researchers. There are cases where junior scientists are divorced from the design and review of research projects and are assigned specific activities without being given any understanding of how this relates to the whole research program. The SEAPRAP evaluation available from the SS division stressed the need for the supervisory role to be clearly defined and for that project, a predetermined timetable for consultations based on each phase of the research was proposed.

> *EXAMPLE: The evaluation of the Andean Pact network suggests that a number of potential training opportunities were lost because there was insufficient attention given to the transfer of technical advice to weaker teams in the design of the project.*[1]

Study Tours

Some types of knowledge may best be acquired through travel to other related institutions conducting similar types of research. Study tours can be an effective method for overcoming the relative isolation of scientists in LDCs who lack funds to receive the latest journals, attend conferences or learn from other experienced colleagues of the same institution. They can be valuable because of their individualized nature, if objectives are clearly defined and if the amount of time at each stopover is sufficient to allow the trainee to adjust and learn.

However, study tours are comparatively expensive (based on cost over time), are an administrative headache, and, at times, have only modest training payoff.

1. Andean Pact: Technology Policy (3-P-73-0017) Evaluation submitted to Board of Governors October 1978.

EXAMPLE: From the Philippine country profile: "Study tours have at times been used to reward personnel with foreign trips that are little better than junkets ... during which no significant learning took place"

When study tours are being considered, less expensive and less cumbersome alternatives should be assessed. Alternatives include duplicating and mailing printed matter or correspondence with colleagues at other institutions In fact, some individuals believe that if the researcher is supplied with current reference materials on a regular basis, the need for study tours is minimized.

The study team believes that study tours can be particularly useful for more senior personnel who cannot take time to participate in longer courses and who can maximize the value of brief exposure to colleagues' work. Generally, study tours do not seem to be effective training tools for junior researchers or when numerous stop overs are planned into any one tour.

Training by IDRC Staff and Consultants

At times, specific skill deficiencies may best be overcome by sending Centre staff or consultants to work with project personnel.

Compared to other more formal training, consultant and staff visits can be easily and quickly organized, can have considerable multiplier effects and can be designed for individual specific skill needs or for broader project team appeal. In situ training using outside expertise is also less apt to be out of context as compared to off-project training.

However, if specific training tasks of the consultant and staff are not clearly identified and understood an outsider's limited involvement

can destroy the internal dynamics of a project, and little training may actually take place.

Summary

As most Centre supported training takes place within the research project mechanism, the kind of training supported by the Centre should be compatible with the project framework and meet the training needs of the research team. The review of training methods in this study indicates that short term training methods are most compatible with the project mechanism, can be tailored to meet the specific requirements of the research team, and capitalize on the flexible nature of Centre support. Formal post graduate training may be essential to meet institutional needs but have less impact on the research project.

From the preceeding discussion, it is recommended that:

A. the Centre should concentrate training efforts on improving skills and knowledge deficiencies related to research projects funded by IDRC.

B. the focus on training activities be given to mechanisms other than formal post graduate university training but where formal university training is still considered appropriate, Masters level training should be given preference. Requests for PhD. training should be carefully examined to determine its necessity before being approved.

C. the Centre encourage the use of formal and informal short courses including specially designed workshops for transferring skills and knowledge.

D. where on-the-job training is an important objective of research projects, advisory functions be clearly specified.

E. alternative means of transferring materials and information be considered before study tours are supported. Study tours should be restricted to more senior staff, have limited stop overs, and clearly defined goals and anticipated benefits.

F. The Centre experiment with and evaluate different training techniques or combinations of techniques to meet specific needs of research staff on Centre-supported projects.

G. because some of the initiatives that are being encouraged differ from that which has been supported in the past, the Centre recognize that such a shift may require some different skills within IDRC.

PRIMARILY TRAINING PROJECTS

Program staff reported in the OVPP study on Appropriate Policies toward the LLDCs that the real objective of many research projects in weaker institutions was the training of inexperienced scientists rather than any realistic expectation of achieving the research objectives as outlined in the Project Summary. Training is an important stated objective in a number of projects and in some, the budgetary allocation for training is the largest single component.

Projects in which the training of young, inexperienced scientists is the primary or sole objective have been somewhat loosely grouped and called 'Primarily Training' projects (see Appendix 2). While some program staff felt that discussions on Primarily Training Projects were unimportant since the amount of training provided was relatively modest, it is estimated that the number of individuals who have received training through Primarily training projects approaches 1/3 of the toal number of trainees supported by the Centre.

Primarily Training Project Issues

There is a debate within the Centre concerning the extent to which the organization should become involved in projects which are primarily training rather than research projects.

Some Centre staff contend that the lack of trained manpower is the most limiting constraint to effective research and that channelling funds through research projects will have little effect until more scientists are trained. In neglected or new research subjects, there are almost no scientists at all with even a general training who could undertake a research project.

Other staff felt that the Centre's expertise is in funding research projects and a shift in direction will demand different staffing, structural and operational requirements, and will put additional stress on the Centre's already limited resources. There has been concern that the demand for trained manpower is so large that the Centre's resources could all be devoted to training with little real impact.

Training projects may do little to fill general manpower requirements and there is no guarantee that individuals trained will subsequently carry out research.

Another concern expressed within the Centre is the danger of small award projects overlapping with the awards given by the Fellowship Program.

Description of Primarily Training Projects

Some imaginative approaches have been followed in developing Primarily Training projects particularly within the Social Sciences Division. While each project has its own unique features, it would appear that they can be grouped within the following four categories:

Individual Formal Training Awards

Several projects of this type have been approved in which individuals are given grants to complete degree or short course training.

The first and largest of this type is the Regional Research and Training Program funded through the Social Sciences Division and administered by ADC. Ninety-nine individuals from seven Asian countries received support over the past eight years for Masters level training in various agricultural disciplines. An evaluation of the project concluded that

the project was cost-effective and all participants considered the program highly successful. The ADC project had many desirable features including the local selection of trainees, knowledge of local institutions and individuals, the provision of follow-up assessments and evaluations, the use of workshops and so forth.

The only concern expressed about this program has been that ADC is not an Asian established or managed organization and thus may not build Asian expertise in managing an awards program.

There is a discussion of intermediary granting organizations at the conclusion of this chapter.

Small Research Grants

These Primarily Training projects most closely resemble institutionally based research projects which have a training component. In some cases, projects which provide small individual grants have been selected because research capability in certain disciplines is so limited or so scattered among various institutions that it would be impractical to develop a large research project at any one institute.

Such projects are considered as Primarily Training projects because they are justified on the basis that they provide the best opportunity for young and inexperienced scientists to enhance their skills by on-hands research exposure and give the younger researcher an opportunity that he/she may not get as part of a larger research project. There is usually little expectation that the initial research grant would result in any significant research conclusions.

The SEAPRAP project is a notable example of this type. An evaluation of this project noted that significant training payoffs

resulted with the role of the advisor being a key to the success of the training element.

The success of the SEAPRAP program has led to further experimentation and approval of the MEAWARDS and AWAREC projects within Social Sciences. Most such projects have common characteristics - namely, they provide grants to individuals and not institutions; they are given to young or inexperienced researchers; and they are managed within the region. Not all projects include supervised research. Although the PLAMIRH project funded through Health Sciences was not planned as a training exercise and did not include supervised research, the awardees emphasized the value of the award as a training tool.

The evaluation report on PLAMIRH indicated that "the responsibility of directing research, the demands of making periodic reports, the consequences of obtaining final results, including having to handle importations, purchase of materials and contracting of personnel, made up activities that helped (the participants) feel more mature and sure of themselves as researchers".[1]

Intermediary Organizations

Some mechanism must be used to select and manage an awards program for trainees or small research grants. It would be an enormous drain on IDRC staff resources if IDRC staff ran such a program itself and this has not been done. The questionnaires confirmed that trainees and project leaders strongly wanted at least local involvement if not complete control over selection procedures.

The study team believes the use of LDC intermediary agencies which disperse IDRC funds is useful in creating additional management

1. M. Requeno, R. Asch, H. Tono, "OVPP Evaluation of the Latin American Research Program in Human Reproduction: PLAMIRH" 1979

capability in selecting, monitoring and evaluating an awards program.

Where no appropriate local granting organizations exist, two alternatives have been proposed. Some Centre staff have suggested that consideration be given to the establishment of a regionally-run awards program, perhaps using the facilities of a Regional Office. This would allow IDRC to maintain closer monitoring and involvement with the awards and also give the Centre greater access to expertise developed by the awards administrators.

A second option is to foster the creation of local granting agencies. The Centre has already fostered the creation of local granting agencies and the use of such groups seems attractive if it achieves the general goal of greater local control over training. However, there does appear to be some danger that local organizations created exclusively by donor agencies to channel funds may not have any long term viability, may have no local support and may not meet locally defined priorities. They may become 'phantom' organizations.

Building Training Institutional Capability: Formal Training Courses

The Centre has supported a few training course or curriculum development projects such as Social Science Research Training (Indonesia) and Library Training (Mauritius).

One of the more controversial projects of this kind placed before the Board was the IDRC/SPRU Training Program in 1976 funded by the Social Sciences Division. Although interest in science and technology policy research was growing in the LDCs, there were few scientists, except in Latin America, with any experience in this subject and no adequate training capability. It was decided to develop a program using the

facilities of the Science Policy Research Unit at the University of Sussex.

An evaluation[1] of the project concluded that the program had been successful in creating a cadre of knowledgeable researchers and assembling an unprecedented collection of teaching material with a focus on Third World issues. The evaluation recommended that future courses should be held in a LDC institute to encourage the development of an indigenous training capability.

While the study team argues elsewhere for relying primarily on the research project mechanism to provide highly focused training, there are clearly some areas where the shortage of trained scientists is so acute or where no training institutional facilities exist in some regions or in new research fields, that training support through the research project mechanism is inefficient.

The development of a strong self sustaining reserarch capability in a country requires the development of an indigenous capability to reproduce the research community. Teaching institutions which are primarily universities become important centres of research themselves. In the longer term then the development of teaching facilities in the Third World as a viable alternative to those available in the industrialized countries is an integral part of the objective of creating a stronger research community in the LDCs.

The study team recommends the Centre take a longer term perspective to building research capability by financing specific training projects in areas of critical shortage within the Centre's program areas. This could involve more projects such as Library Training (Mauritius) where a

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1. Girvan, N., Clark, N. "OVPP Evaluation Report on the IDRC/SPRU Training Program" 1979

curriculum is prepared, appropriate teaching material collected or written up and several test courses carried out.

Some Centre staff have expressed similar concerns to those discussed by the Board when such projects have been presented in the past. The IS presentation on page 39 refers to the Board rejection of a regional post graduate program in Information Science which was to be based at the University of the Philippines. It was suggested during the Board meeting that such activities are more properly the responsibility of CIDA or other donor agencies although sometimes other agencies lack the technical expertise or the flexibility of the Centre in helping to define training programs in new research areas.

Another concern sometimes raised is that such training programs are part of the responsibility of training institutions and, as such represent a form of core support. There are, however, already a number of cases where the Centre has provided restricted core support to research institutions to allow them to develop new programs which are then carried on with the institutions own resources after Centre support is terminated.

If there is however, a major escalation in the number of training projects, the Centre would probably require a change in the present staffing pattern which is geared to formulating and administering research projects.

In-House Training

All Divisions use staff or consultants in some capacity to guide inexperienced project scientists. The IS Division also uses staff consultants to train researchers through short seminars and

courses in the Centre itself. The Board has expressed some concern over the desirability of in-house training rather than identifying some LDC institute or an intermediary organization to conduct such training. However, IS contends that there are very few suitable and available facilities, specifically in the case of the MINISIS program where the Centre has a unique capability and expertise.

For both pragmatic and philosophical reasons, it is suggested that IDRC should not become heavily involved in operating its own training programs. Where no viable alternative exists, the Centre must continue in-house training, but parallel efforts should be made to ensure transfer of responsibility to other agencies.

Summary

In spite of the strong justification for maintaining the research project mechanism to provide training, there is a clear need to take a broader and long-term view of training needs within the Centre's mandate. The Program and Policy Review discussed by the Board in March 1980 drew attention to the shortage of trained researchers as the main constraint in developing research programs in certain sectors. Should not the Centre therefore take a longer-term perspective and finance specific training projects and build training institutional capability in areas of critical shortage such as Rural Water Supply and Sanitation, Agroforestry or Aquaculture?

Given the growing number and innovativeness of the multiple small grants projects, additional evaluations would help provide better guidance on the relative merits of these small individual grants vis-a-vis larger institutional research projects in different situations and sectors. Use of national or regional LDC intermediary organizations to manage awards grants is consistent with the general IDRC principle that LDC

scientists and institutions should define and manage their own programs.

In-house training activities are necessary in areas of unique capability but parallel efforts should be made to create training capability elsewhere which can assume these training requirements.

NEW INITIATIVES AND PERSPECTIVES FOR IDRC TRAINING[1]

Most of the review in this paper has centered on an assessment of ongoing methods of training. Some individuals within and outside the Centre are concerned that a conservative mood prevails in most donor agencies and that those organizations which have the potential of being at the frontier are reluctant to take risks or investigate new programs.

The study team believes that further experimentation on new approaches to training is needed in IDRC. Some of the new initiatives given below are still being reviewed; others are being tested.

Purpose of the Centre's Focus on Training

Why should the Centre focus on its training programs? New skills and new confidence, acquaintance with new methods, awareness of broader research issues are rather obvious answers. What is not so clear is the boundary between the 'data-gatherer' and professional 'scientific' researchers or those individuals who have internalized the logic and system of research, who are skilled in all stages of the research process and who see research as a career-long effort to assemble a body of knowledge in a specific field.

In other words, there is a research mentality which might be considered the ultimate goal of the Centre's research and training activities. The aim might be a generation (and in some countries a re-generation) of a cadre of scientists who consider research a profession and a vocation and apply

1. Many of the ideas expressed in this section were drawn from a paper written by Sheldon Shaffer, Program Officer - Education, for the study team.

themselves systematically over time. How such a mentality can be encouraged (if at all) through preferred Centre activities such as short courses, on-the-job training, and skill-specific workshops requires further study.

Research and Action at the 'Local' Level

In most areas of IDRC programming, research is meant to produce knowledge or technologies applicable to the needs of the LDCs -- particularly those of the poorer, more marginal communities. Much of this new knowledge, however, is generated by researchers and planners at the national level and thus neither relates to the actual conditions or needs of the poor nor is easily transmitted to those meant to be the ultimate beneficiaries of the research. A number of different initiatives might be attempted in Centre programs to overcome these problems.

First, from the perspective of research, there is a need to work more at the local level -- the village, the farm, the school -- where baseline data are gathered and where observation of development problems is most direct. For example, to guarantee the adequacy and validity of information gathered at this level, training programs in simple but important techniques of collecting and aggregating data might be designed for officials and practitioners (clerks, teachers, health workers).

Another example, even more basic, is the model of participatory research, in which those who are or will be affected by the research (e.g. farmers and teachers, merchants and students) are directly involved in designing and implementing the study. Through such a process, large groups of people who are traditionally outside the established research community and who often lack formal training acquire important and useful skills while participating in the research. Often they also gain an appreciation for the value of research and later may be

more willing to implement research findings. Teachers, for example, asked to join researchers in describing and analysing pupil behaviour, not only gather useful data for the study but also become more sensitive to pupil reactions to their classroom methods.

The Centre-supported Research Review and Advisory Group (RRAG) is currently planning a review paper on the experience of participatory action research in Latin America (an area of the world where the politically liberating and consciousness-raising aspects of such research is especially strong). Centre support for and monitoring of groups which endorse the participatory model for wider or different perspectives should be considered.

From the perspective of practical action at the local level, training programs can be developed for those who transmit the new-found knowledge and technologies to those who need it most. Technicians/teachers/animateurs can be trained not only in the use of the new technologies but also in the best means of transmitting and implementing the new knowledge. Some type of in-service activity will be needed.

A "Systems" Approach to Training

If the research personnel working on a project are considered as a unit, the skill deficiencies of the team may be quite different from those of any one individual. In this sense, training needs are dictated by the research project itself and not by gaps in the knowledge of any one team member. This makes the need for extensive post-graduate training less critical.

A more holistic "systems" approach would view training needs in relation to various professional layers of personnel and various stages of the research process. For example, a junior researcher may work under the direct supervision of a senior researcher during the early theoretical and conceptual stages of the research. He might then follow a short course in research design, return to continue this supervised research, and participate, perhaps as a teacher, in a methodology workshop for more junior staff. A more lengthy post-project award at another institution in the Third World might complete this training program, while the senior researcher might carry out a sabbatical in a related field in North America. In these ways, different skills of different kinds of researchers are systematically upgraded.

Training Institute Needs

Many components are needed to establish a viable environment for research training (e.g. teaching materials, libraries, research activities, equipment, competent instructors. Since home based training is being encouraged in this study and many LDC training facilities are somewhat lacking in material prerequisites, the

Centre should pay more attention to these needs. Supplemental support should be considered at training facilities -- even those which are not project institutes. Such funding may be channelled through separate agreements with training institutes or through additional support for materials and equipment in the trainee's agreement.

In the past training facilities (to a considerable extent in the industrialized countries) were assumed to have the necessary prerequisites. In future, this assumption should be critically examined and more effort should be directed at collecting and synthesizing data on various training facilities.

Self Education

There are numerous self-education activities that the Centre could pursue to upgrade and augment research capability within the LDCs. Experimentation with radio programs, printed materials, simulation games, and so forth have some value in training researchers and specifically those involved in participatory research models. Although such self-education endeavours have not been seriously considered by the Centre, they do have merit under some conditions and warrant further study and experimentation.

Manpower Utilization

Through the Centre's training support a considerable pool of expertise has been built in many disciplines. However, there is evidence that individuals trained through Centre auspices are not being utilized to any degree by IDRC. Many researchers, particularly from the LDCs have considerable knowledge and experience that could be used on a short term basis.

Monitoring and Evaluation

It has been stressed throughout this report that preferred and most cost-effective methods of training are not clear-cut. More experimentation, monitoring and evaluation are needed to broaden the Centre's knowledge and to establish which training methods are most appropriate under given situations.

Some evaluations have been carried out and with more expected, a comparative review of these evaluations will improve the Centre's ability to select the most appropriate training mechanisms for different situations.

The research projects supported by the Education Group in the Social Sciences Division and the related activities of the RRAG provide another source of carefully researched work on some of the issues raised in this paper. A review of the results of this work would be useful to Centre staff, perhaps through a paper to the Board at some stage.

There is also a distinct need to improve the reporting and compilation of data relating to training. The PIN's system is an inadequate source since training activities are often subsumed within other budget headings and not referred to in project documentation. It is recommended that project documentation provide more explicit description and rationale for training activities, budget, number to be trained and location.

APPENDIX I

NUMBER OF AGRICULTURAL SCIENTISTS PER MILLION PEOPLE ENGAGED IN AGRICULTURE

NUMBER OF SCIENTISTS PER MILLION	C O U N T R Y*		
Over 50	Argentina	Jamaica	Paraguay
	Brazil	Jordan	Philippines
	Chile	South Korea	Taiwan
	Colombia	Libya	Tunisia
	Costa Rica	Malaysia	Uruguay
	Cyprus	Nigeria	Venezuela
	Ghana	Panama	
31-50	Ecuador	Mexico	Senegal
	Egypt	Nicaragua	
	Ivory Coast	Peru	
16-30	Bangladesh	Iran	Sri Lanka
	Bolivia	Iraq	Thailand
	Cameroon	Kenya	Zambia
	El Salvador	Malawi	
	Gambia	Morocco	
	Honduras	Sierra Leone	
1-15	Afghanistan	India	Niger
	Benin	Indonesia	Rwanda
	Burundi	Liberia	Somalia
	Chad	Madagascar	Sudan
	Ethiopia	Mali	Tanzania
	Guatemala	Mauritania	Togo
	Haiti	Nepal	Uganda
	Upper Volta	Zaire	

*LLDC: underlines

SOURCE: IFPRI

APPENDIX 2

PRIMARILY TRAINING PROJECTS

The following were classified as "Primarily Training Projects and reviewed for the purpose of this study. The list is not exhaustive of all those Centre projects which might be termed Primarily Training".

1.	IDRC/SPRU Training Program	3-P-76-0005
2.	a. Southeast Asia Population Research Award Program - Phase III (SEAPRAP)	3-P-77-0137
	b. Population Research Support Program (Southeast Asia) - Phase II	3-P-76-0012
3.	Dynamics of Internal Migration (Southeast Asia) RAPPID	3-P-78-0038
4.	Population and Development Awards (MEAWARDS)(Middle East)	3-P-79-0079
5.	a. Council for Asian Manpower Studies (CAMS) - I	3-P-74-0062
	b. Council for Asian Manpower Studies (CAMS) - II	3-P-74-0150
	c. Council for Asian Manpower Studies (CAMS) - III (Public Enterprise Fellowship)	3-P-75-0108
6.	a. A/D/C Regional Research & Training Program (Asia) 1978	3-P-77-0043
	b. A/D/C Regional Research & Training Program (Asia) 1979	3-P-78-0074
	c. A/D/C Regional Research & Training Program (Asia) 1980	3-P-79-0056
7.	Social Research Training (Indonesia)	3-P-740067
8.	Social Science Development - East Africa "Circuit Rider"	3-P-76-0137
9.	PLAMIRH (Biomedical Support Program - Phase II (Latin America)	3-P-76-0084
10.	AWARERC (Education and Development Awards) (West Africa)	3-P-70-0014

11.	PISPAL (Population Policy Research)(L.A.)	3-P-77-0099
12.	SS Research Methodology (Indonesia)	3-P-79-0143
13.	Library Training (Mauritius)	3-P-70-0001
14.	Technonet	3-P-79-0151
15.	Research Fellowships	3-P-79-0159

APPENDIX 3

STUDY TEAM PARTICIPANTS AND TRAINING ADVISORY COMMITTEE

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1. Paul Eastman and Carol Sissons, both former IDRC employees, served as consultants for this study, while Don Simpson, formerly Associate Director of the Education Program in Social Sciences, reviewed various earlier drafts.

APPENDIX 4

ACRONYMS USED IN THIS STUDY

OVPP	Office of the Vice President, Planning
TAC	Training Advisory Committee
AFNS	Agriculture, Food and Nutrition Sciences
LDC	Less developed country/countries
LLDC	Least developed country/countries
R & D	Research and Development
F.P.	Fellowship Program
PINS	Project Information System
RAP	Recipient Adminstered Portion of Centre Project Budgets
RAP/DAP	Project Activity Program/Division Activity Project
HS	Health Sciences
IS	Information Sciences
AGRIS	International Information System for Agricultural Sciences and Technology
FAO	Food and Agricultural Organization of the United Nations
INFOPLAN	Planning Information System
MINISIS	Interactive Mini Computer System for Information Retrieval and Library Management
ADC	Agricultural Development Council
RRAG	Research Review and Advisory Group
PISPAL	Population Policy Research (L.A.)
AWARERC	Education and Development Research Awards (West Africa)